97-A67

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State of California

Memorandum

To : Mr. Lester Snow
CALFED Bay-Delta Program

Date : November 24, 1997

From : **Department of Fish and Game**

Subject : Review of Flow Analysis for Fisheries and Aquatic Resources

The Department of Fish and Game has reviewed the subject document and offers the following comments.

General Comments

The amount of water diverted to storage and exported will depend upon capacity and operational restriction. Will comparisons be based upon maximums for each alternative? Manipulation of operations across alternatives may be sufficient to skew results in favor of a particular alternatives.

As described, there is insufficient modeling available to assess the affects fully.

It is not specified which four months the DWRDSM will be run nor does the flow analysis specify the water year types covered.

Specific Comments

Page 1, Paragraph 1

We are concerned that the information currently available to assess how alternatives affect internal Delta flows will only support a "coarse" level of analysis. The analysis should be completed when the data described as "Information Currently Unavailable" are available.

Page 1, Paragraph 2

This paragraph hypothesizes that the change in the "volume" of water available to meet ecosystem needs is potentially more important than monthly flow or diversion output from DWRSIM. Since this may not be the case we advocate that operation model output be provided to assess project alternatives. This could be accomplished after each alternative's range of flexibility is identified and the operational assumptions defined for the lower and upper limits of operation. These model outputs could then be used to complete the alternatives analysis.

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Page 1, Paragraph 2, Sentence 2

Include the word "net" or "gross" in between "in volume".

Page 1, Paragraph 3

If the DWRDSM based analysis is biased, this bias should be corrected or minimized and the remaining limitations disclosed. The reason for the use of the four months selected was to define different combinations of inflow and export; i.e. High:high, Low:high, Medium:high, and Low:low. If this doesn't reflect an adequate range then other years should be selected so that conditions such as Low San Joaquin Inflow can be compared to conditions of low to high Sacramento River inflow and low to high exports. The 16 years of channel flow information should be effective at more accurately describing effects on internal Delta hydraulics. The months in this time period should, however, be inspected to ensure that conditions such as those described above related to San Joaquin inflow are covered.

Page 1, Paragraph 3, Sentence 1

Replace "may not" with "cannot" and "may" with will. The sentence will then read," The analysis of impacts based on DWRDSM studies *will* be biased because the four months selected for the mass fate analysis *cannot* represent the full range of Delta conditions and will represent conditions that occur infrequently."

Page 1, Paragraph 3, Sentence 3

This sentence should be deleted.

Page 1, Paragraph 3, Sentence 4

The basis of "natural condition" assumptions should be documented.

Page 1, Paragraph 5, Sentence 2

This sentence implies a different approach to selecting "targets" than used in the ERPP and because of the reference to the alleged lack of ecological or statistical support for target flow ranges. The reference to unimpaired conditions is fine and the link should be made to why that is considered reasonable ecological justification.

CALFED should consider using flow duration and magnitude in addition to flow ranges. In combination, these factor will better describe the biological and ecological affects.

Page 2, Paragraph 1, Sentence 2

The Mass Fate Particle Tracking Model does not represent biological responses in an

aquatic system accurately, as most aquatic resources do not behave like inert suspended material. This limitation should be acknowledged.

Page 2, Paragraph 2

Two additional injection points were used that were not mentioned here; Terminous and San Andreas Landing. They should be added here.

Page 2, Paragraph 5

Do structural changes to Delta channels include installation of barriers? This should be made clear.

Page 2, Last paragraph, Bullets

Add, "throughout the Delta" to the last bullet.
Add a bullet that states, "Flow conditions with limited exports from the south Delta."

Page 3, Paragraph 1, Sentence 2

Replace this sentence with," Uncertainties exist regarding the adequacies of flows to meet CALFED's ecosystem restoration objectives.

Page 3, Paragraph 2, Sentence 3

This should also include a temporal component that has a biological basis, such as, the 90 day smolt outmigration window.

Page 4, Paragraph 1

Modeling, inherently, obscures variability with in the system being modeled. The addition of one degree standard deviation above and below the simulated mass fate increases the extreme changes that are occurring. We disagree with using one standard deviation above and below the simulated mass fate and recommend using the straight modeled information with the caveat that there is natural variation that will affect all alternatives.

This approach would also allow CALFED to analyze year-type affects prevalent in the 16 year study period.

Page 4, Paragraph 2

Redraft this section to use the model output in a different way. For example, use the output for the various alternatives to illustrate to what extent the target defined by the unimpaired condition is attained, e.g. Alternative X achieves 60 % of the target values in months when San Joaquin inflow is low (e.g. $<1,500$ cfs) and export pumping is high (e.g. $>5,000$ cfs).

G-006213

This concludes our comments at this time. If you have any questions about our input or wish to discuss these issues further, please contact Mr. Frank Wernette or Ms. Heather McIntire at CALNET 8-423-7800.

Cindy Costa for:
Pete Chadwick
CALFED/DFG Liaison

cc: Ms. Bellory Fong
Mr. Frank Wernette
Ms. Heather McIntire

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